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August 18, 1999

***VIA Overnight Mail***

Arizona Corporation Commission
1200 West Washington
Phoenix, Arizona 85007-2996

RE: U S WEST § 271 Application
Docket No. T-00000B-97-0238

To the Commission:

Enclosed please find an original and ten copies of AT&T and TCG Phoenix's Comments for the First Amended Set of Workshops on Advanced Services, Line Sharing, Sub-Loop issues and Dark Fiber, and an unexecuted Verification of Ken Wilson. An executed Verification will be filed with the Commission early next week.

Please feel free to contact Michel Singer Nelson at 303-298-6527 if you have any questions.

Sincerely,

for

Richard S. Wolters
Michel Singer Nelson

Enclosures

BEFORE THE ARIZONA CORPORATION COMMISSION

CARL J. KUNASEK
Chairman
JAMES M. IRVIN
Commissioner
WILLIAM A. MUNDEL
Commissioner

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| IN THE MATTER OF U S WEST COMMUNICATIONS, INC.'S COMPLIANCE WITH § 271 OF THE TELECOMMUNICATIONS ACT OF 1996 | Docket No. T-00000A-97-0238<br><br>AT&T and TCG Phoenix's Comments |

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AT&T Communications of the Mountain States, Inc. and TCG Phoenix (collectively "AT&T") hereby submit these Comments for the First Amended Set of Workshops on Advanced Services, Line Sharing, Sub-Loop issues and Dark Fiber.

## I. INTRODUCTION

The United States Congress conditioned Qwest Corporation's (formerly known as U S WEST Communications, Inc., hereafter referenced as "Qwest") entrance into the in-region interLATA long distance market on Qwest's compliance with 47 U.S.C. § 271. To be in compliance with § 271, Qwest must "support its application with actual evidence demonstrating its *present* compliance with the statutory conditions for entry."[1]

As AT&T has previously stated in its Comments in this proceeding, the Arizona Corporation Commission is charged with the important task of ensuring that Arizona's local telecommunications markets are open to competition and that Qwest is complying with its

[1] In the Matter of Application by Bell Atlantic New York for Authorization Under Section 271 of the Communications Act to Provide In-Region, InterLATA Service in the State New York, Memorandum Opinion and Order, CC Docket No. 99-295, FCC 99-404 (Dec. 22, 1999) at ¶ 37 [hereinafter "FCC BANY Order"].

obligations under both the state and federal law. While remaining the final decision-maker on Qwest's compliance with its § 271 obligations, the Federal Communications Commission ("FCC") looks to the state commissions for rigorous factual investigations upon which the FCC may base its conclusions.

To conduct a rigorous investigation, one must understand both the legal standards that Qwest is held to and, importantly, Qwest's actual implementation of those standards. Releasing Qwest to compete in the interLATA long distance market before it has fully and fairly complied with its obligations under § 271 will discourage, if not destroy, competition in both the local and long distance markets in Arizona.

Many a local competitor, including AT&T, has invested heavily in this State on the promise of open, fair competition in the local exchange market. AT&T requests that this Commission, through its rigorous investigation of Qwest's claims in this proceeding, ensure that the nascent local competitors realize that promise. To that end, AT&T respectfully submits these Comments addressing the topic of "Emerging Services," which includes Subloop Unbundling, Line Sharing and Line Splitting, Packet Switching and Dark Fiber.

Through these workshops, the Arizona Corporation Commission is conducting its investigation of both Qwest's Statements of Generally Available Terms ("SGAT") and Qwest's actual compliance, or lack thereof, with the checklist items contained in 47 U.S.C. § 271(c)(2)(B). With respect to the SGAT review, a "State commission may not approve such statement unless such statement complies with [§ 252(d)] and [§ 251] and the regulations thereunder." 47 U.S.C. § 252(f). Furthermore, a state commission may establish or enforce other requirements of state law in its review of the SGAT. Id.

To demonstrate compliance with the requirements of § 271's competitive checklist, Qwest must show that "it has 'fully implemented the competitive checklist [item]... .'"[2] Thus, Qwest must plead, with appropriate supporting evidence, the facts necessary to demonstrate it has complied with the particular requirements of the checklist item under consideration.[3] Qwest must prove each element by a preponderance of the evidence.[4] Furthermore, the FCC has determined that the most probative evidence is commercial usage along with performance measures providing evidence of quality and timeliness of the performance under consideration. Finally, as with any application, the "ultimate burden of proof that its application satisfies all the requirements of section 271, even if no party files comments challenging its compliance with a particular requirement[,]" rests upon Qwest.[5]

## II. DISCUSSION

### A. Subloop Unbundling

#### 1. Introduction and Background

The FCC has concluded that incumbent LECs must provide unbundled access to subloops where technically feasible.[6] The FCC further states:

> We define subloops as portions of the loop that can be accessed at terminals in the incumbent's outside plant. An accessible terminal is a point on the loop where technicians can access the wire or fiber within the cable without removing a splice case to reach the wire or fiber within.[7]

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[2] FCC BANY Order at ¶ 44.
[3] Id. at ¶ 49.
[4] Id. at ¶ 48.
[5] Id. at ¶ 47.
[6] In the Matter of Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, FCC 99-238, CC Docket No. 96-98 (Released November 5, 1999) at ¶205 ("*UNE Remand Order*").
[7] Id. at ¶ 206.

Qwest must provide subloop unbundling, under rates, terms and conditions that are non-discriminatory. To fulfill this obligation, Qwest must address the following subloop elements and points of interface in its SGAT and in its operational processes and procedures:

1. Distribution facilities
2. Feeder facilities
3. Feeder/Distribution Interface (FDI)
4. Minimum Point Of Entry (MPOE)
5. Network Interface Device (NID)
6. Riser Cable in multistory buildings
7. Inside Wire
8. Peripheral Distribution Facilities
9. Wire Closets
10. Digital Loop Carrier cabinets
11. Single Point of Interface (SPOI)
12. Central Office Terminal, COSMIC or MDF
13. Pole or Pedestal
14. And any other technically feasible element or point of interface.

Qwest must further demonstrate that access is available at all technically feasible speeds, with technically feasible media including:

1. 2 wire copper
2. 2 wire non-loaded copper
3. 4 wire copper
4. DS-1 carrier
5. DS-3 carrier
6. OC-3 through OC-xx SONET over fiber

In its SGAT and Interconnection and Resource Guide ("IRRG"), Qwest has not adequately covered any of these subloop elements, access points, or interface speeds and media and has not even addressed many of them.

AT&T and other competitive local exchange carriers ("CLECs") will need to lease Qwest subloop elements in a variety of locations and under a variety of conditions. Such access to subloop elements is needed to support facilities based market entry using hybrid fiber-coax ("HFC") infrastructure, wireless infrastructure and traditional telephony infrastructure. One of

the location types where subloop access is critical is in the access to and provisioning of multiple dwelling units ("MDUs") and campus type environments.

Qwest uses a wide variety of equipment types, configurations, and media in its local network. To adequately address all configurations that a CLEC may need to access, Qwest must present both general and specific obligations to cover the CLEC's range of subloop needs. These comments address and review each of the elements and interface points separately, examining typical applications in many cases. Qwest witness, Karen Stewart, in her affidavit, states that the CLEC must utilize the BFR process to access any of the sub-loop elements or access points that are not currently provided as "products" by Qwest.[8] The FCC has identified Subloop as an unbundled element and has defined its scope and application.[9] The CLEC should not be required to go through the laborious BFR procedure to access subloop elements. Existing subloop elements and subloop access points, in the current Qwest loop plant, should be provided through the SGAT and in interconnection agreements without resorting to the BFR process. It is not sufficient, as Ms. Stewart suggests, for Qwest to wait until demand arises to provide all of the necessary sub-loop elements and access points.[10]

Subloop elements and subloop access points are discussed together because many situations arise where a subloop access point can be a subloop element. For instance, the Feeder/Distribution Interface ("FDI") can be an access point for feeder facilities. The FDI can also be a subloop element when the FDI is a Digital Loop Carrier ("DLC") device that the CLEC may need to lease. Exhibit KW-1 represents the various subloop elements that will be discussed below. It should be noted that these elements and interface points are all shown on a single loop.

[8] Supplemental Affidavit of Karen A. Stewart, July 21, 2000, at page 29, lines 1-2.
[9] *UNE Remand Order* at ¶¶205-229.
[10] Id., at page 29, lines 6-7.

This is rarely if ever the case. In most circumstances, many or most of these elements and interface points will not exist on a single loop. Many residential loops, for example, are provided over copper wire from the central office to a simple residential NID. The FDI in this case, may be no more than a basic interface junction on a pole where multiple copper distribution "drops" are aggregated together onto the Feeder back to the central office.

### 2. Description of Individual Subloop Elements and Access Points

**a. Feeder Facilities.** Feeder Facilities are roughly defined as the local network facilities that run from the MDF or COSMIC in the central office to the FDI in a field location.[11] Feeder facilities may physically be comprised of copper, coaxial cable or fiber media. Copper media may support basic service or digital ready basic service where load coils and bridge taps have been removed. Copper or coaxial media, with associated electronics, may provide DS-0, DS-1, or DS-3 capability. Fiber, with associated electronics, may provide SONET capability at a prescribed speed. These "fiber to the neighborhood" facilities must be made available to the CLEC. Qwest must provide access to existing types of feeder facilities and allow new types of feeder facilities to be accessed as they are deployed, at technically feasible locations.

**b. Distribution Facilities.** Distribution Facilities can be generally defined at the facilities that run from the FDI to the NID at the customer location.[12] This general definition is complicated in MDU or campus type configurations where Distribution Facilities may terminate at intermediate points. Such intermediate points are described using several different terms, including minimum point of entry ("MPOE"), garden terminals, and wiring closets.

[11] See, generally, *UNE Remand Order* at ¶¶205-207.
[12] See Id.

Distribution Facilities are typically copper, but may be provided by other media. Until relatively recently, it was thought impossible to carry signals other than simple voice grade 300-3000 Hz on Distribution Facilities longer than a few hundred yards. Technologies are now able to carry high-speed data signals on clean copper Distribution Facilities for an increasing number of miles. If Qwest places fiber in the distribution plane, "fiber to the curb," CLECs should have access to those facilities. Qwest must provide access to existing types of Distribution Facilities and allow new types of Distribution Facilities to be accessed as they are deployed, at technically feasible locations.

c. **Feeder Distribution Interface (FDI), DLC Cabinets, Poles and Pedestals.** The FDI is the location where Feeder Facilities are joined to Distribution Facilities in the local network.[13] The FDI may be simple, as is the case with an all copper loop, or very complex where Digital Loop Carrier ("DLC") is used for pair gain or digital services in the feeder. The FDI is a major point of access to the Feeder and Distribution subloop elements and as such must be provided where technically feasible.[14] The FDI may be located in a cabinet, hut, CEV or other structure or location. It is critical that CLECs have nondiscriminatory access to remote terminals at the FDI, or in any other location where they are used in association with loops. Accordingly, Qwest must provide access to Distribution Facilities and Feeder Facilities at any FDI, where technically feasible.

The FDI may itself be a subloop element when multiplexing or advanced services capabilities are involved.[15] DLC terminals of varying types should be made available as subloop elements.[16] The CLEC may need to lease a portion of the DLC terminal to aid in providing

[13] *UNE Remand Order* at ¶206.
[14] Id.
[15] Id.
[16] Id.

advanced services such as ISDN. The FDI may also contain equipment for providing Digital Subscriber Loop ("DSL") capabilities. DSL equipment may consist of a Digital Subscriber Line Access Module ("DSLAM") or other equipment that utilizes high frequencies over short loops to provide high-speed data. Qwest is has been conducting trials and initial deployment of next generation DSL ("NGDSL"). This capability allows high-speed data as well as television signals to be transmitted over the loop. In NGDSL, a sophisticated terminal is put in the neighborhood at the FDI. The feeder is provided over fiber. Use of these new technologies should be included in the SGAT.[17] Accordingly, Qwest must provide access to the FDI as a subloop element where technically feasible.[18]

Poles and pedestals are used in the Qwest loop plant to aggregate distribution facilities. Often these poles and pedestals are the FDI, or part of it. Sometimes, however, the pole or pedestal is not part of the FDI and contains terminals or connections that could be accessed by the CLEC. Although required, Qwest has not provided for poles and pedestals that are not part of the FDI.[19]

**d. Central Office Terminal, COSMIC or MDF or Other Central Office Device.**

CLECs must have access to the central office end point of subloop Feeder Facilities.[20] For simple copper Feeder Facilities with no intervening electronics, this access will be at the COSMIC, MDF or an intermediate frame of the CLEC's choice. Where DLC or other technology is used in conjunction with Feeder Facilities, the CLEC may need access to the Central Office Terminal ("COT") that provides termination for DLC or other types of transport. Where fiber facilities are used, the CLEC must have access to the appropriate Hub/Mux or Fiber

[17] The details relating to Qwest's provision of DSL capabilities will be discussed later in these comments.
[18] *UNE Remand Order* at ¶210.
[19] Id. at ¶206.
[20] Id.

Distribution Panel. Qwest must provide access at the central office for Feeder Facilities at any technically feasible point.[21]

e. **Network Interface Device (NID).** The NID is a subloop element. However, AT&T will not address it in these comments since it is scheduled to be discussed in a separate workshop.

f. **MPOE, Garden Terminals, Panels in Equipment Closets, and other Connectivity Means.** Qwest must provide access to all types of interconnection points that may be situated in MDU, campus or highrise type locations.[22] These interconnection points are variously called Minimum Points Of Entry ("MPOE"), garden terminals, equipment closet panels and by other terms and names. Any cabinet, panel, or other equipment that allows access to wiring associated with the loop should be included in this category. One example would be a connection panel located at either an initial building, such as a service building, or at an MDU complex. This panel may be called a NID, but it may alternatively be designated as an MPOE with the NID being located nearer to the end-user. Alternatively, the MPOE may be at the MDU with the NID located at the service building. In either case, the CLEC must have access at either the NID or the MPOE. Another example would be telephone panels in equipment closets on each floor of a high rise. CLECs need access to each of these types of interface points for access to subloop elements. The FCC and other state public utilities commissions, such as the Georgia commission, have stated that the ILEC must construct a Single Point Of Interface ("SPOI") which can be accessed by multiple CLECs if the existing loop interface is not adequate to accommodate a number of local providers.

[21] Id.
[22] Id. See also *UNE Remand Order* at ¶¶210, 186.

**g. SPOI.** The FCC has determined that the ILEC must provide a Single Point of Interface (SPOI) at MDUs and high-rise type locations where access to inside wire, riser cable, peripheral distribution facilities or other subloop elements are not otherwise available.[23] Where MDUs or other high rise type locations have access panels, MDU, or other access points which will give CLECs equal access to end-users in the buildings exist, these access points must be made available to the CLECs. Where such access points do not currently exist, the ILEC, Qwest in this case, must construct a panel where all CLECs and Qwest have equal accessibility to access points for the end user connections. This access point has been termed the SPOI. An illustration of a SPO is depicted in Exhibit KW-2. Qwest's FCP is not equivalent to the SPOI. The FCP is an intermediate connection point that Qwest proposes to insert at the FDI. It is second class interconnection for CLECs at the FDI, giving CLECs access, though not equivalent to Qwest, to the FDI. Even if Qwest maintains that it would apply the FCP concept to points of interconnection at MDUs and other locations, the FCP is not equivalent access. The FCP gives the CLECs access through an additional frame or connection panel that Qwest does not use.

**h. Peripheral Distribution Facilities, Inside Wire and Riser Cable.** The CLEC must have access to any wire or cable that the Qwest owns or controls in the loop.[24] In MDU, campus and high-rise configurations, there may be wire or cable that is not generally thought of as part of the Distribution Facility. When this wire is inside a single floor business or residence, it is normally called "inside wire." When wire is located in a high-rise building, it may be called "riser cable." When wire runs between buildings in a campus type configuration, it may be called by various names, but will be referred to as Peripheral Distribution Facilities in Qwest's SGAT. All of these wires or cables serve the purpose of connecting end-user equipment to the

[23] *UNE Remand Order* at ¶226.
[24] Id. at ¶210.

ILEC Distribution Facilities. The CLEC must have access to these subloop facilities where technically feasible.

i. **Other Facilities and Equipment Making Up the Loop.** The foregoing list of subloop elements and access points is not exhaustive. Other elements and access points may exist in the Qwest loop plant. Further, some elements and access points may have different names from those used above. Such elements should not be prohibited due to a difference in common name or in apparent function. Qwest should provide access to any subloop element or access point used in any portion of its loop plant unless it can prove to the CLEC, and the Commission, that the element or access point is technically infeasible for the CLEC to access.

**3. Analysis of Qwest's SGAT and Testimony Relating to Subloop Unbundling**

The Qwest SGAT addresses sub-loop unbundling in Section 9.3. Although Qwest must address all of the elements and access points discussed above, the SGAT merely addresses 2-Wire Distribution and DS1 Feeder. Qwest fails to address the remaining elements and access points explicitly. If Qwest intends generally to address the other elements and access points as part of the two elements addressed in the SGAT, then it must provide additional descriptions to accomplish that purpose. As is, Qwest fails to address the majority of subloop elements and access points.

The following serious problems exist with the manner in which Qwest is providing access to the two subloop elements addressed in the SGAT:

a. requiring an intermediate connection point;

b. lengthy provisioning delays;

c. limiting spectrum on Distribution Facilities; and

d. lack of rates for sub-loop elements.

a. **Field Connection Point (FCP).** Qwest introduces the concept of the Field Connection Point ("FCP") as the method of access by the CLEC to the two sub-loop elements that Qwest is offering.[25] The FCP appears to be an intermediate connecting panel, analogous to an intermediate frame. Qwest seems to be requiring an intermediate panel much as Qwest required an unnecessary intermediate frame in the Central Office. The FCP appears to be the sub-loop equivalent to the SPOT frame. CLECs should be able to select a single point of interconnection, i.e., direct connection to FDI panels and equipment. An additional connection panel, such as the FCP appears to be, should be offered as an option, not a requirement, since it is not consistent with the FCC requirements.[26] Qwest's requiring an additional, intermediate connection panel adds time and cost to the CLECs' sub-loop needs.

b. **Lengthy Provisioning Intervals.** Qwest is proposing a very lengthy provisioning interval for access to sub-loop elements.[27] Sub-loop elements are only available after a CLEC requests Qwest to install an FCP. The SGAT refers to an initial interval of 30 days to review a request for placing an FCP. After the request has been reviewed and the CLEC has accepted it, and paid an unspecified amount, Qwest will construct the FCP within 120 days. Only after the FCP has been constructed can the CLEC actually place an order for the subloop element.[28] Assuming that the CLEC takes 14 days to accept the request and pay, and the time for provisioning of the order is another 20 days, the total time required is 6 months. This is far too long. CLEC customers will not wait 6 months for service. The construction of the FCP is the determining factor. This is yet another reason that Qwest cannot require the FCP.

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[25] SGAT § 9.3.7.
[26] Qwest's previous attempts to impose the "SPOT" frame or other kinds of intermediary equipment to impair CLEC's access to UNEs have been generally unsuccessful. See, e.g. Commission Order On Rehearing, Decision No. C98-1047, Docket No. 96S-331T (Adopted October 1, 1998) (Colo. Pub. Util. Comm.)
[27] SGAT § 9.3.11.
[28] SGAT § 9.3.11.4.

c. **Spectral Restrictions.** Qwest is restricting the spectrum of the two wire Distribution Loop to the frequency range of 300 to 3000 Hz. This is unacceptable as it would limit the CLECs' ability to provide DSL services over the Distribution Loop. DSL services use frequencies above 3000 Hz to carry high-speed data. No limitation should be placed on the use of spectrum on Distribution Facilities because it is contrary to the purposes of the Act and FCC interpretations.[29] The CLEC should get the full benefit of Distribution Facilities' capabilities.

d. **Lack of Rates.** Qwest has not provided rates for any of its sub-loop elements. Without knowledge of Qwest's proposed rates, both recurring and non-recurring, AT&T can not determine if Qwest is offering sub-loop elements at non-discriminatory prices, as required by Sections 252 and 271 of the Act.

e. **Additional Problems with the SGAT**. In paragraph 9.3.3 of the SGAT, the FDI is referred to as the "Fiber Distribution Interface." While the CLEC needs access to fiber in the feeder plant, this reference seems to be a mistake, as Qwest does not appear to be offering fiber facilities in the feeder. In addition, the last sentence in the first paragraph of 9.3.8.1 is unnecessary, as the previous sentence noted the same issue. Further, there may be times when Qwest owns inside wire and would be a party to the CLEC gaining access. There is no mention of waiver of costs when another CLEC has previously requested access to a particular FDI and Qwest has already done a feasibility study and any "make ready" work. There should be some reimbursement mechanism for the first CLEC to access an FDI. Time frames should also change for subsequent CLECs. These issues are not handled appropriately in the SGAT.

f. **Additional Problems with Qwest Witness Karen Stewart's Supplemental Affidavit.** On page 24 of her affidavit, Qwest witness Karen Stewart makes reference to Qwest Technical Reference Publication No. 77405. Because Ms. Stewart did not provide this document

[29] See, e.g., *UNE Remand Order* at ¶¶166-176.

for review, there is no way to determine if it is consistent with provisions of the SGAT or expands on them. Qwest should be required to provide that publication in conjunction with its testimony in this docket.

In addition, on page 30 of her affidavit, Ms. Stewart describes a method to share costs between the CLECs for the establishment of the FCP. Ms. Stewart states that the third CLEC using the FCP would pay 17% to each of the first two. This sharing relationship is at odds with the FCC's requirement for a single point of interconnection for multiple carriers.[30] All carriers, including Qwest, should share the cost of any network reconfiguration required to create a single point of interconnection. The cost sharing provision should be included in the SGAT. The current SGAT does not contain this provision.

In the last paragraph on that same page, Ms. Stewart states, "After the construction of the FCP, Qwest will provision Two-Wire Unbundled Feeder Sub-Loops ..." Does Ms. Stewart mean to refer to DS-1 Unbundled Feeder Sub-Loops in this sentence?

**4. Summary of Subloop Issues**

In sum, Qwest is not providing the sub-loop elements required by the Act and the FCC rules. The Qwest SGAT only provides 2 wire voice grade analog Distribution and DS-1 Feeder. The following items are sub-loop elements or access points (or, in some instances, both) and are not addressed by the SGAT and thus not available from Qwest:

1. Feeder/Distribution Interface (FDI)
2. Minimum Point Of Entry (MPOE)
3. Network Interface Device (NID)
4. Riser Cable in multistory buildings

[30] *UNE Remand Order* at ¶226.

5. Inside Wire
6. Peripheral Distribution Facilities
7. Wire Closets
8. Digital Loop Carrier cabinets
9. Single Point of Interface (SPOI)
10. Central Office Terminal, COSMIC or MDF
11. And any other technically feasible element or point of interface.

Further, even where Qwest is providing Feeder and Distribution, it is not providing all of the types of facilities that are used in the Qwest loop plant. The following facility types are not covered by the SGAT and must be addressed:

1. 2 wire non-loaded copper
2. 4 wire copper
3. DS-3 carrier
4. OC-3 through OC-xx SONET over fiber

For the sub-loop elements that Qwest is actually providing, Qwest imposes serious impediments which slow the CLECs' market entry and unnecessarily increase costs. These include long provisioning delays, unnecessary intermediate panels and restrictions on spectrum use. Qwest must rewrite its SGAT section on sub-loop to comply with the Act and the FCC orders, making it much more extensive and addressing the elements and facility types listed above. Until Qwest agrees to provide all of the required elements and facility types, Qwest will not satisfy the Act's or the FCC's requirements relating to sub-loop elements.

## B. Line Sharing and Line Splitting

### 1. Introduction

The FCC requires Qwest to allow CLECs, including the so-called "data local exchange carriers" ("DLECs") access to the high frequency spectrum of the local loop.[31] These obligations take several forms:

- Qwest must allow CLECs and DLECs to place splitters on loops where Qwest provides voice telephone service so that the CLECs and DLECs can offer Digital Subscriber Line ("DSL") services.

- Qwest must allow collocation of DSLAM equipment where loops are being provided using Digital Loop Carrier ("DLC").

- Qwest must allow CLECs to provide voice and high-speed data service over unbundled loops.

- Qwest must allow CLECs to add splitters to customers' loops where service is being provided to the end-user by AT&T using UNE-P service.

- Qwest must offer a UNE-P arrangement with splitter where the loop being requested already has the splitter installed.

- Qwest should be required to place splitters which Qwest would own on loops and allow AT&T to order those loops as UNE-P, line by line.

[31] In the Matter of Deployment of Wireline Services Offering Advanced Telecommunications Capability and Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, FCC 99-355, CC Docket Nos. 98-147 and 96-98 (Released December 9, 1999) at ¶16 ("Line Sharing Order").

Moreover, Qwest must offer all of these capabilities under rates, terms and conditions that are just, reasonable and non-discriminatory. As demonstrated in the following discussion, Qwest is imposing serious impediments on CLECs with respect to the first item, line sharing. Further, Qwest is failing to offer, or is refusing to offer, the other six items.

## 2. Digital Subscriber Loop Technology ("DSL")

DSL technology has its roots in Bell Labs some 20 years ago. The idea is simple: to put high-speed data over existing copper loops normally used for basic telephone service. As the speed and complexity of computer chips have advanced, DSL has come of age. DSL is now able to provide high-speed Internet service and regular voice service simultaneously over a single loop. Currently, the most common form of DSL is Asymmetric Digital Subscriber Line ("ADSL"). ADSL can transmit data "upstream" from the home to the Central Office at speeds up to 640 KB (Kilobits per Second). ADSL can transmit data "downstream" from an Internet Service Provider to the residence at speeds up to 6 MB (Megabits per Second). Other types of DSL provide lower or higher speeds, but ADSL is the most common. Qwest's *Megabit Service* is an example of a DSL service that uses ADSL technology.

Exhibit KW-3 shows the basic architecture for DSL. A DSL modem is put in the home, connecting to the telephone line, the telephone, and a personal computer. At the Central Office of the telephone company, the local loop (the telephone line) is connected to a DSLAM. This device separates voice calls from internet and email data traveling on the loop. The voice calls are routed over the traditional "switched network" via an End Office Switch in the same way that regular telephone calls are completed.

The modem in the home and the DSLAM in the Central Office use a much broader range of frequencies on the local loop to achieve high data speeds and simultaneous voice calls.

Before this can happen, the telephone company may need to remove load coils and bridge taps from the local loop. Load coils and bridge taps are a vestige of loop rearrangements and obsolete party line technology that, in general, are no longer needed in the local loop.

The one problem, which has limited the basic application of DSL, is the maximum distance the residence can be from the Central Office. Basic ADSL is limited to loops with a maximum distance from the Central Office of about 3 miles (18,000 ft.) This is the reason that DSL has come more quickly to metropolitan areas where residences and small businesses are close to the Central Office. Old distance limitations have been falling by the wayside, and there are now architectures to bring DSL to virtually every home and business using remote terminals.

New technology is bringing DSL to areas farther away from the Central Office. Over the past decade, many telephone companies have been extending the reach of their traditional telephone network with the use of DLC. DLC extends the loop by placing a remote terminal in the neighborhood and running high-speed trunks back to the Central Office. The trunks to the Central Office can be arbitrarily long, using fiber optics, coaxial cables, or copper technology with repeaters.

The effective loop length is from the remote terminal to the residence of business. Thus, for example, if the remote terminal is 10 or 20 miles from the Central Office, a residence within 3 miles of the remote terminal can be easily served. This is an effective way to provide telephone service to subdivisions that are farther than a few miles from the Central Office.

Equipment manufacturers have developed ways to bring DSL to neighborhoods served by Digital Loop Carrier. Special ADSL cards are now made to go into the remote terminal. These ADSL cards will provide the features of DSL that are enjoyed by people living in cities. Exhibit KW-4 shows a typical architecture that is used to provide DSL over Digital Loop

Carrier. The Remote Terminal is connected to the Central Office either via Central Office Terminal ("COT") or through equipment directly integrated with the End Office Switch. When a COT is used, a separate DSLAM may be used to separate voice calls from Internet data. When the Digital Loop Carrier is integrated with the switch, the DSLAM function is built into the ADSL card in the switch.

### 3. Analysis of Qwest's Line Sharing Proposals

Qwest presents its proposal for line sharing in Section 9.4 of its SGAT. The Qwest proposal is based on the Interim Line Sharing Agreement that Qwest made with a number of DLECs for 13 states on April 24, 2000. As the Commission knows, Qwest has submitted numerous versions of its SGAT. These multiple versions have created some confusion over Qwest's actual position on any given issue. Line sharing is one of those issues. The section on line sharing in the SGAT Qwest filed in Arizona on July 7, 2000 ("Arizona SGAT") is not consistent with a more recent SGAT filed in Colorado on August 1, 2000 ("Colorado SGAT"). The Arizona SGAT does not allow direct connection for access to the COSMIC/MDF. Instead, it requires the use of the Interconnection Distribution Frame ("ICDF") (formerly known as the SPOT frame.) Interestingly, in its Colorado SGAT, Qwest fixes this problem, adding a section on direct connection.

On the other hand, the Arizona SGAT provides more detail than the Colorado SGAT on the terms and conditions of line sharing. Since both SGAT filings seem to contain recent changes, these comments review both SGATs so that the appropriate issues are raised, irrespective of which SGAT is reflects Qwest's true position on the issue.

**a. Arizona SGAT.** The main problem with the Arizona SGAT Qwest filed on July 21, 2000, is the requirement that the CLECs use the ICDF when establishing connectivity

between the Qwest COSMIC or MDF and CLEC provided splitters. No direct connection option for this connectivity is provided. AT&T has worked with Qwest for the past 5 months to establish that direct connection is technically feasible. Ultimately, Qwest has agreed to provide direct connection for interconnection trunking, 911 trunking and for unbundled elements. The lack of this connectivity option in the Arizona SGAT is inconsistent with Qwest policy. Qwest must add direct connection as an option for CLEC connectivity from the COSMIC/MDF to collocated splitters. The configurations that Qwest is proposing must be examined in light of this omission. Further, the diagrams that are provided by Ms. Stewart with her testimony, KAS-4 and KAS-5, do not give sufficient detail to determine the actual connectivity that would be required. It does not appear that Ms. Stewart addressed direct connection, but the diagrams do not show enough detail to determine how the connections can be made. Qwest must provide more detail on connectivity and indicate in that detail if direct connection is allowed.

In paragraph 9.4.1, Qwest states that: "The POTS service must be provided to the end user by Qwest." AT&T takes issue with this restriction for several reasons. First, the FCC has stated in its recent Order on SBC's Section 271 application in Texas that the CLEC can provision splitters on loops otherwise provided using the unbundled platform (UNE-P).[32] Second, the CLEC should be allowed to provide any service that it chooses when an unbundled loop is ordered from Qwest. Third, the CLEC should be able to order a UNE-P configuration and have Qwest leave any splitter on the loop if the loop already has one. Finally, AT&T should be able to order a UNE-P configuration and have Qwest provide a splitter that Qwest would own. It is not clear from the Qwest restriction in paragraph 9.4.1 whether Qwest considers these arrangements

[32] In the Matter of Application by SBC Communications inc., Southwestern Bell Telephone Company, and Southwestern Bell Communications Services, inc., d/b/a Southwestern Bell Long Distance Pursuant to Section 271 of the telecommunications Act of 1996 to provide In-Region, interLATA Services in Texas, FCC 00-238, CC Docket No. 00-65 (Released June 30, 2000) at ¶330 ("Texas 271 Order").

line sharing or not. Since AT&T would be providing both the voice and the data in these circumstances, the restriction may not apply as AT&T would not be sharing the voice and data but would be providing both to the end-user. This issue is discussed in more detail below.

Qwest is proposing new rate elements and interim prices in its SGAT for line sharing. AT&T does not agree with all of the rate elements that Qwest is proposing or with the prices that Qwest has suggested. AT&T believes that the rates Qwest is proposing should be reviewed in the permanent cost docket. AT&T does not agree that the OSS charge in paragraph 9.4.3.1.2 should be included as a rate element. AT&T does also does not feel that a charge for "Tie Cable Reclassification" is warranted. This charge, according to paragraph 9.4.3.3, relates to the use of the Tie Cable from the ICDF to the CLEC's collocation. This cable, in the ICDF configuration, is the responsibility of the CLEC. Qwest does not need to know how the cable is being used. There should be no charge from Qwest regarding changes in use for this cable.

Paragraph 9.4.4.3 further discusses the reclassification of CLEC Tie cables. As described above, such reclassification is not necessary. Qwest must explain why this step is a requirement.

**b.** **Colorado SGAT.** The SGAT that Qwest filed in Colorado on August 1, 2000, offers direct connection between a CLEC provided splitter and the Qwest COSMIC or MDF in paragraph 9.4.2.2.3.2. However, the Qwest proposal for direct connect has a few problems that would be unreasonably costly to the CLEC. First, the paragraph requires the CLEC to trunk to every module on the COSMIC. This is unreasonable and would force the CLEC to incur the cost of too many cables to the COSMIC and would use up capacity on the COSMIC too quickly. Qwest should allow for a more reasonable build out, such as provisioning cables to every other or every third module on the COSMIC/MDU.

Second, Qwest is requiring the CLEC to do a special Mechanized Engineering and Layout for Distributing Frame ("MELD") run for the CLEC's build-out to the COSMIC frame. A MELD run provides information to Qwest OSS as to how connections can be made efficiently on the COSMIC. Qwest does MELD runs for multiple purposes on each of its COSMIC frames. For example, MELD runs would be needed for the inclusion of splitters and DSLAM equipment for Qwest's DSL product. Qwest should simply put CLEC needs for connections to the COSMIC into a planned MELD run and not require the CLECs to fund a separate MELD Run. A MELD run costs thousands of dollars. Requiring CLECs to fund separate MELD runs is not necessary and a barrier to entry.

While SGAT Section 9.4.2.2.3.2 provides for direct connection when the splitter is in the CLEC collocation area, Qwest has not provided for direct connection when splitters are placed in a common area of the central office. Section 9.4.2.3 requires this configuration to use an ICDF. The ICDF is unnecessary in this configuration. Direct connections can be made from the COSMIC/MDF to common splitter bays. This is more efficient for CLECs and more efficient for Qwest.

**4. The SGAT on Line Splitting**

Qwest has only addressed line sharing in its SGAT. Line sharing, as allowed by Qwest, requires the CLEC to own the splitters and is only available on loops where Qwest is the voice provider. Qwest has made no provision, however, to allow CLECs providing voice service using unbundled elements, specifically UNE-P, to also offer high speed data service on the same loop. The FCC has addressed this issue in its ruling on the Southwestern Bell Telephone 271 application in Texas. In that ruling the FCC acknowledges the importance of "so-called line

splitting," and further requires the ILEC to allow the CLEC to provide high speed data service on lines where the CLEC is using UNE-P.

> [I]ncumbent LECs *have an obligation to permit competing carriers to engage in line splitting over the UNE-P* where the competing carrier purchases the entire loop and provides its own splitter. The record reflects that SWBT allows competing carriers to provide both voice and data services over the UNE-P. For instance, if a competing carrier is providing voice service over the UNE-P, it can order an unbundled xDSL-capable loop terminated to a collocated splitter and unbundled switching combined with shared transport to replace its UNE-P configuration with a configuration that allows provisioning of both data and voice service. SWBT provides the loop that was part of the existing UNE-P as the unbundled xDSL-capable loop, unless the loop that was used for the UNE-P is not capable of providing xDSL service.[33]

This FCC Order validates AT&T's position that CLECs must be allowed to have access to the entire spectrum in a loop when they purchase the whole loop. Qwest has made no provision for line splitting in its SGAT or its testimony in this case. The SGAT condemns the CLEC to voice only over UNE-P configurations. This Commission should require Qwest to own and deploy splitters and make them available on a line-at-a-time basis. The following paragraphs discuss why requiring line-at-a-time splitters, owned by Qwest, makes technical and practical sense.

Access to the HFS of the loop is critical to AT&T so that it, like Qwest, can offer its customers – either on its own or in conjunction with a data provider – DSL services on the same loop used to provide local voice services. As part of providing voice CLECs with access to the HFS of the loop, Qwest should be required to insert (into a local loops) Qwest-owned, deployed and maintained splitters that are provided on a line-at-a-time basis. Although Qwest has not definitively refused to provide access to the HFS of the loop, it has refused to own splitters and provide access to them on a line-at-a-time basis. Qwest's refusal to provide technically feasible

[33] Id. At 325 (emphasis added).

access to splitters, combined with its inaction with respect to allowing UNE-P voice CLECs to access the HFS of their loops has the direct effect of denying residential and small business customers who wish to obtain DSL services, the ability to select anyone other than Qwest as their local voice carrier.

The following paragraphs focus on the lack of any compelling technical reasons for Qwest to reject AT&T's proposal for line splitting.[34] The practical implication of Qwest's current refusal to perform technically feasible line splitting is that for each passing day that UNE-P based voice, CLECs lack the capability to access the HFS portion of their loops, Qwest is further able to lock-up its base of local voice customers and increase the likelihood that customers who want xDSL services will have no choice but to remain with Qwest or to abandon their CLEC-provided local voice service and return to Qwest for such service. The result is a lessening of competition for both voice services and bundled offers of voice and data services. Absent a Commission decision on this issue, only Qwest will be able to offer a complete package of local, toll and Internet access services over a single line. This significant competitive advantage is ill-gained, resulting only from Qwest's refusal to provide straightforward and technically feasible support to its potential competitors.

In order to ensure the development of competition for voice services and bundled offers of voice and data services, the solution for CLECs, customers and competition is simple – Qwest should be required to support access to the HFS by inserting a splitter on UNE-loops employed in the UNE-P combination. As the following discussion will demonstrate, no technical

[34] Line splitting occurs when the ILEC insets a splitter into a UNE-Loop (including those employed in the UNE-P combination) so that a UNE-P CLEC may provide both voice and data services, either on its own or with another CLEC, utilizing a single loop facility terminating at the customer's premises. On the other hand, line sharing occurs when the ILEC provides the underlying voice service and another party provides the data service infrastructure, regardless of which party inserts the splitter. See Texas 271 Order at ¶324.

impediments exist that prevent Qwest from owning splitters and inserting them into loops used in a UNE-P configuration. Moreover, such a requirement would result in beneficial efficiencies and improved customer service. Qwest should therefore be directed to comply expeditiously with AT&T's request.

The Act and the FCC's implementing orders and regulations require that a CLEC be able to obtain all of the features, functions, and capabilities implicit in the UNE so that it can offer any telecommunications service that can be provided by means of that UNE.[35] Accordingly, when a voice CLEC provides service through the UNE-P configuration, the ILEC should be required to perform the technically feasible step of placing a splitter on the loop to allow the voice CLEC to access the broadband functionality of the loop, especially since this is the most efficient way to create access to the broadband functionality of the loop.

**a. Technical Feasibility of Line Splitting.** Access to the HFS of the loop is accomplished through inserting a splitter into the loop, regardless of whether Qwest is supporting line sharing (where Qwest retains the voice service and retail customer relationship) or is supporting line splitting (where Qwest retains neither the voice traffic nor retail customer relationship). There is no debate that a splitter is a passive electronic device that is added to the loop before the loop terminates upon the switch that is used to provide service to the end user. Inserting the splitter into the loop essentially creates two loops within a single physical outside plant loop facility. The first "loop" carries the voice frequency band transmitted within the facility and the second "loop" carries the high frequency transmission band transmitted within

[35] See 47 C.F.R. Section 51.307(c); *UNE Remand Order* at ¶ 175; Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, CC Docket No. 96-98, "First Report and Order," 11 FCC Rcd 15499 (rel. Aug. 8, 1996), aff'd in part and vacated in part by Iowa Utils. Bd. v. FCC, 120 F.3d 753 (8th Cir. 1997), aff'd in part and rev'd in part by AT&T Corp. v. Iowa Utils. Bd., 525 US 366 (1999) ("Local Competition Order"), ¶ ¶ 258, 260, 268. AT&T's written comments will address the legal basis for Qwest's obligation to provide access to the HFS of the loop via a Qwest owned splitter.

the same facility. Each of the two loops created by the insertion of the splitter is cross-connected to the appropriate (voice or data) network for delivery of the specific services sought by the customer.

The derived loop dedicated to the high frequency spectrum (the high frequency output of the splitter) is cross-connected to a data network (generally through collocation where a DSLAM is located). The second derived loop (the low-frequency or analog voice output of the splitter) is cross-connected to the circuit switched network (typically the local switching UNE). There is no question that it is technically feasible to deploy a splitter to create two derived loops. Setting aside who owns or operationally supports the splitter and who owns the space in which it is deployed, the architecture involved in providing access to the HFS of the loop to voice CLECs using UNE-P (i.e., line splitting) involves essentially the same architecture that Qwest uses today to line share with its data affiliate or data CLECs. Stated simply, the work involved in inserting a splitter and the functions the splitter performs are the same regardless of whether the splitter is used to provide line sharing or line splitting.

Given that there is no technical impediment to Qwest deploying a splitter to permit access to the HFS of the loop, the only question that remains is whether Qwest should be required to own and provide splitters on a line-at-a-time basis or be allowed to restrict itself to the Line Sharing options where Qwest retains control of the voice portion of the loop.

**b. Line-at-a-time deployment.** When splitters are deployed a line-at-a-time, the architecture is as follows: (1) the outside plant facility from the customer's premises is brought to the main distributing frame ("MDF") at the ILEC's serving central office; (2) the outside plant facility is cross-connected from its appearance on the MDF to the splitter input; (3) the HFS output of the splitter (which could have either an appearance on the MDF or be connected to an

intermediate distributing frame) is cross-connected to a CLEC's DSLAM (which, in a central office deployment, is generally within collocation space and would be cabled out to a frame appearance); and (4) the "voice loop" (the low frequency output) of the splitter is cross-connected to the switched network (e.g., the local switching UNE). The outputs from the splitter establish separate paths for the voice and data streams that operate independently from one another, but are carried together within a single outside plant facility.

The technical and economic reasons why access to Qwest owned splitters on a line-at-a-time should be required are simple, and can be best illustrated by a walk- through of Qwest's Scenario C in comparison to the line-at-a-time arrangement advocated by AT&T and other CLECs. As described above, the splitter creates two loop facilities from one single outside plant facility. Within the splitter, a set of filters permits only low frequency transmission to transit one pair of wires. The low frequency splitter output is cross-connected to the circuit switched network, providing a voice loop.

The set of filters in the splitter also permits only the high frequency signals to be directed to the DSLAM. The splitter is cross-connected to the data CLEC's data network, providing a data loop. Under a line sharing option, as proposed by Qwest in its SGAT, the CLEC-owned splitter is connected directly to the CLEC's POT Bay.

Now assume that the customer's data provider is switched out. Because the splitter is owned by, and dedicated to, a single CLEC and hardwired to the CLEC's collocated equipment, disconnection of the data service is achieved by disconnecting the splitter from the customer's outside plant facility's appearance on the MDF. In doing so, the cross-connection for the voice portion of the loop must also be disconnected because it connects the "voice loop" from the old data CLEC's splitter to the voice switch. As a result, the customer's voice service is interrupted

and is not re-established until the cross-connections are made to the new data provider's splitter shelf.

In order to re-establish the customer's data and voice service, the new data provider's splitter input must be cross-connected to the outside plant, and the "voice loop" output of the new data provider's splitter must be cross connected to the ILEC's local switching element. All of this re-wiring would need to occur -- and be coordinated -- at the time of service delivery. Setting aside the fact that a needless voice service disruption occurs, there must also be non-essential work for which the retail customer must ultimately pay. Specifically, the re-wiring to a different splitter (with all its potential for associated service interruption and added cost) must be done for the sole purpose of putting back what was just removed, i.e., the splitter. This requirement is even more nonsensical because the splitter, while essential to subdividing the frequencies on the outside plant facility, does not (and cannot) provide any opportunity for service differentiation among either data or voice providers.

By contrast, the process of switching data providers is far less disruptive and simpler in the line-at-a-time splitter access arrangement. In the line-at-a-time splitter configuration, the data outputs of the Qwest owned splitters are wired to appearances on a distributing frame, as are the input ports of the DSLAMs. The splitter data output and the input port of the DSLAM are then cross-connected. To change the customer's data provider, the only thing that needs to be done is to replace the cross-connect between the frame appearance of the HFS output of the splitter and the original data provider's frame appearance with a cross-connect from the same splitter frame appearance to the frame appearance of the new data provider's equipment. When the cross-connect is disconnected, there is no disruption to the "voice loop" because it remains untouched. Thus, the changing of data providers is virtually transparent to the end-user

customer. Data service is re-established when the new data cross-connection is wired, which is easier and quicker than changing out entire splitters that are owned by and dedicated to one data provider.

Such transparency is important because the retail customer will usually be purchasing a package of complete voice and data services, not a particular company's packet transport. Thus, to the extent the provider of the retail bundle of voice and data seeks to change the supplier of a component of that package (in this case the DSL access), customer satisfaction demands that the change be virtually undetectable to the retail customer. This is similar to the situation that exists today with respect to long distance service. Access is a critical component to the complete retail service, but the retail customer typically is not involved in determining of how such access is provided. Replacement of access arrangements must be seamless, since retail long distance customers have little to no tolerance for service disruptions, even those necessary to reduce cost or improve service quality.

The line-at-a-time splitter arrangement is highly preferable to the shelf-at-a-time wiring configuration involved in line sharing using splitters in common collocation for numerous reasons. Significantly, the line-at-a-time arrangement effectively assigns the splitter to the outside plant facility, rather than being dedicated to a single CLEC. As a result, CLECs share a splitter owned by Qwest, and voice service remains intact when the data provider is changed.

When line-at-a-time splitter deployment is supported, CLECs can pre-wire their data networks (i.e., DSLAMs) to the same frame where the high frequency output of the splitters terminates. Likewise the input terminal for the splitter input (i.e., where the outside plant terminates) and the voice frequency output of the splitter (to the extent the splitter is remotely located from the MDF) can be pre-wired to the MDF. As a result, when initial service is

requested only three cross-connections must be worked: (i) from the outside plant to the splitter input; (ii) from the splitter voice output to the switch port; and (iii) from the splitter data output to the data CLEC's network's appearance on the frame. This involves only one additional cross-connection (connection (iii) above) at the time of service provisioning for line splitting than is required when Qwest engages in line sharing.

The line-at-a-time approach also yields benefits when a customer subsequently terminates individual services. If the customer terminates its data service, but not its voice service, Qwest can remove only cross-connection (iii), which cross-connects the data loop to the data provider's collocation. In such a situation, the customer does not lose voice service. In contrast, if the CLEC owned the splitter, the customer would have to be disconnected from the voice switch when the data provider ceases to perform the splitting function. The customer's voice service would not be reinstated until the facility from the customer's premise was disconnected from the input to the splitter, the switch port was disconnected from the voice output of the splitter and the outside plant facility was re-connected to the switch port. When disconnection of the data service occurs in conjunction with a customer moving, leaving the splitter set up in place seems prudent because it would permit the subsequent occupant to take advantage of the DSL capability of the loop without generating the needless costs associated with splitter re-insertion.

In the unlikely event that a customer disconnects his or her voice service, but not his or her data service, the voice capability could be blocked through translation changes in the switch. While this scenario is not one that is likely to occur, Qwest could avoid (or defer) committing the resources to remove the splitter from the line until the splitter capacity was required for a customer desiring both voice and data on the line, or until it was clear that the customer would not reinitiate voice service on that line.

The numerous operational advantages described above make it clear that Qwest should be required to provide the line-at-a-time option to CLECs. These benefits will only increase as more customers seek to have their voice and Internet access service provided over a single line.

Any claims by Qwest that the benefits of the line-at-a-time approach have been compromised by the initial deployment of splitters consistent with line sharing should be disregarded. DSL is in its infancy and significant increases in demand are expected. For example, the DSL market is estimated to grow to 2.5 million lines by the end of this year.[36] This growing demand will necessitate additional splitter deployment. Thus, requiring that Qwest provide splitters on a line-at-a-time basis now will allow CLECs to switch to this option early on in the deployment of DSL services rather than later.

Moreover, the efficient and non-disruptive ability to change DSL providers is a critical consideration for UNE-P CLECs providing data service via some form of a commercial arrangement with a data CLEC rather than through its own data facilities, as well as for ISPs. The ability to change DSL providers without disrupting voice service allows the UNE-P provider to transition to its own data infrastructure if that becomes an appropriate strategy in the future. In addition, it permits the UNE-P CLEC or the ISP provider (depending on who has the relationship with the data CLEC) to control better the costs charged by and quality of service provided by its commercial data partner. This is so because the ability of UNE-P CLECs or ISPs to change data providers without adversely impacting retail customers encourages data providers to control costs, price their services competitively, and remain at the cutting edge of equipment capabilities to ensure quality service. The real winner here is the retail customer who often has

[36] Business Wire, April 12, 2000, "Three of Nation's Largest Cities to Experience Major New DSL Rollout."

no direct commercial relationship with the DSL provider, and thus is generally powerless to affect the data provider's pricing practices or service quality.

None of this, however, means that CLECs should be denied the ability to deploy their own splitter shelves if this is the route they wish to take. However, Qwest should not be permitted to offer only CLEC owned, shelf-at-a-time splitter deployment since delivery of splitters on a line-at-a-time basis offers CLECs a very efficient and cost effective option that is technically feasible and highly conducive to the development of competition.

## C. Unbundled Packet Switching

Qwest must offer packet switching as a UNE under certain specific circumstances. The FCC has stated that packet switching must be offered as a UNE under the following circumstances:

1. Loops are provided via DLC or related technology,
2. CLECs are unable to obtain spare copper loops,
3. CLECs are unable to install DSLAM equipment at the remote terminal,
4. The ILEC has deployed packet switching equipment for its own use.[37]

Qwest has unilaterally decided that these conditions will never exist and is refusing to offer packet switching as a UNE:

> Qwest believes that these four conditions will not be met in Arizona for the foreseeable future. In the event that copper loops are not available, CLECs can utilize the BFR process to request an alternative arrangement that would meet their specific loop needs.[38]

This position plainly violates the FCC's directives on packet switching. The circumstances under which the FCC mandates that ILECs make packet switching available

[37] *UNE Remand Order* at ¶ 313.
[38] Supplemental Affidavit of Karen A. Stewart, Page 42.

consist in Qwest's network. First, Qwest provides a growing percentage of its loops via DLC for purposes of pair gain, extension of loops to remote areas and the provisioning of advanced services. The DLC is provided over both fiber and copper facilities. Second, in many areas, Qwest has exhausted its copper loop facilities. Qwest is using DLC technology for pair gain in many areas of Arizona. Pair gain is the use of DLC to effectively multiply the number of loops that embedded facilities can serve. This technology typically utilizes existing loops for DS-1 facilities to the pair gain device. Thus, copper loops for use by the CLEC are not available. Third, Qwest has not offered any realistic opportunity for CLECs to install DSL equipment at remote terminals. Fourth, Qwest is the most active of all ILECs in the deployment of its own DSL technology. Qwest is currently conducting trials and initial market roll out, in Arizona, of VDSL technology that allows high-speed data as well as television signals over the loop.

### 1. Loops provided via DLC technology

In those instances in which an ILEC has deployed digital loop carrier ("DLC") systems, a continuous copper facility dedicated to one retail customer no longer connects the customer's premises to the serving central office. DLC can thus create significant impairments in a data CLEC's ability to provide DSL services competitive with those of Qwest.

To provide DSL services when a customer is served by a DLC system: (i) the DLC system itself must be equipped with appropriate electronics and connected to appropriate feeder facilities; (ii) a DSLAM must be deployed remotely from the central office and be connected both to the customer's copper subloop and to outside plant facilities of appropriate bandwidth; or (iii) a continuous copper loop facility having suitable electrical characteristics must be available between the customer's premises and the serving central office.

The FCC recognized that sufficient remote terminal collocation (option (ii)) was an unlikely prospect.[39] Likewise, the FCC recognized that "home run" copper loops short enough to support competitive quality service (option (iii)) would generally not be available where the ILEC is providing (or enabling) DSL service through electronics that are deployed remotely from the central office.[40] Therefore, the FCC concluded that CLECs would be impaired in their ability to compete in the provision of advanced services if the ILEC failed to provide nondiscriminatory access to alternate means for serving such customers.[41]

Accordingly, FCC Rule 51.319(c)(3) requires ILECs to provide unbundled packet switching when four conditions are satisfied:

> (i) the ILEC has deployed digital loop carrier systems, or has deployed any other system in which fiber optic facilities replace copper facilities in the distribution section (e.g., between the end office and a remote terminal, pedestal or environmentally controlled vault);
> (ii) there are no spare copper loops capable of supporting the xDSL services the requesting carrier seeks to offer;
> (iii) the ILEC has not permitted a requesting carrier to deploy DSLAMs at the remote terminal, pedestal or environmentally controlled vault or other interconnection point, nor has the requesting carrier obtained a virtual collocation arrangement at these subloop interconnection points; and
> (iv) the ILEC has deployed packet switching capability for its own use.

In these circumstances, the ILEC must provide CLECs with a packet switching capability that permits a requesting carrier to obtain an "equipped loop." As stated earlier, an equipped loop provides the connectivity between the retail customer's premises and the central office that supports the sending and receiving of both voice communication and data communication services over a single facility terminating at the retail customer's premises at a quality no less

[39] *UNE Remand Order* at § 313.
[40] Id.
[41] Id.

than that which the ILEC provides directly to its retail customers or indirectly through its data affiliate.

Although CLECs are clearly entitled to unbundled packet switching capabilities when the four above-mentioned conditions are met, Qwest's SGAT, which is supposedly designed to bring Qwest into compliance with the FCC's UNE-Remand Order, fails to contain any provisions regarding the unbundled packet switching capability UNE as defined in FCC Rule 51.319(3)(c). Moreover, Qwest has stated in the affidavit of Ms. Stewart that the four conditions required for it to make unbundled packet switching capability available will not occur. There is no basis in fact for this biased, unilateral prediction.

In the following paragraphs, focus on why, as a factual matter, Qwest cannot justify denying the provision of unbundled packet switching capability on the grounds that: (1) spare copper facilities will be available; and (2) it will be able to accommodate adequately all requests for collocation.

### 2. Home run spare copper facilities

In the *UNE Remand Order*, the FCC concluded that one of the four prerequisites to the unbundling of packet switching capability is the lack of spare copper facilities that are "capable of supporting the xDSL services the requesting carrier seeks to offer," and that permit the CLEC to offer "the same level of quality of advanced services" as that offered by the ILEC (or its data affiliate).[42]

When a CLEC seeks to offer DSL service in competition with an ILEC (or its data affiliate) that has deployed its DSLAM functionality at the remote terminal,[43] the CLEC will

[42] Id.

[43] Such deployment could either be a standalone DSLAM or the deployment of Next Generation DLC (NGDLC) that accept plug-in electronics capable of delivering equivalent functionality.

invariably be unable to provide a DSL service that operates with "the same level of quality" (e.g., data rates) as that provided by the ILEC or its data affiliate if the data CLEC must rely on "home run" copper. In such cases, the CLEC's copper loop will extend all the way from the serving office to the customer's premises while the ILEC or its data affiliate can provide service using remotely deployed electronics and shorter copper subloops that reach only from the customer's premises to the remote terminal. The laws of physics dictate that maximum attainable data rates decrease as the length of the copper facility that is used increases. For example, ADSL can reasonably provide network-to-subscriber data transfer rates as a function of the length of the copper facility employed (assuming 24 AWG, no load coils and without bridge taps) as follows:

| **Data Rate** | **Distance** |
|---|---|
| 1.544 Mbps | 18,000 ft. |
| 2.048 Mbps | 16,000 ft. |
| 6.312 Mbps | 12,000 ft. |
| 8.448 Mbps | 9,000 ft. |

Source: www.adsl.com (*General Tutorial: General Introduction to Copper Access Technologies).*

As the above chart aptly shows, a 9,000 ft. copper loop allows for the transmission of data at a rate more than five times faster than an 18,000 ft. copper loop. Indeed, very high data rate Digital Subscriber Line (VDSL) technology has the potential to offer upstream data rates in excess of 1.5 Mbps and downstream data rates of 12.96 Mbps when the copper segment is shorter than 4,500 feet. Accordingly, a shorter copper loop will allow the incumbent (or its affiliate) to offer its DSL customers not only a significantly faster data rate, but also emerging services that require very high transmission rates, such as video.

Needless to say, any CLEC that must use home run copper to compete with an ILEC or ILEC data affiliate that has access to shorter copper subloops at a remote terminal will be at a significant competitive disadvantage. Thus, absent the ability to collocate DSLAM functionality at the remote terminal, or to access the ILEC's unbundled packet switching capability in the form of an equipped loop, the CLEC cannot offer a service of the same level of quality as the ILEC's. Accordingly, condition (ii) of the FCC Rule 51.319(c)(3)(B) will almost always be met.

### 3. Remote terminal space

The FCC's third condition addresses the situation where the CLEC cannot practically deploy DSLAM functionality in the ILEC's remote terminal or other interconnection point. Qwest has taken the position that this condition will not arise. While remote terminal collocation or other forms of subloop interconnection may be theoretically possible, there is little prospect that remote collocation could provide a practical competitive alternative for CLECs.

In order for a CLEC to remotely deploy its own electronics, it must have access to the following: (i) a physical location in which to deploy its equipment (either through physical or virtual collocation); (ii) power to run the equipment; (iii) heat, ventilation, and air-conditioning ("HVAC") to control the equipment environment as appropriate; (iv) sufficient copper pairs to reach customers to sufficiently utilize the equipment it is deploying; and (v) facilities of sufficient bandwidth that connect the remotely deployed electronics to its data network. It is highly unlikely that all of these conditions can be met, and if met, done so in a manner that is economically viable.

With respect to a location for the data provider's equipment, most remote terminals (and the less common controlled environment vaults ("CEVs")) generally lack sufficient space for

physical and virtual collocation of much, if any, equipment for a single CLEC, let alone multiple competitors. Qwest has resisted including CEVs in the definition of "premises" for the past four years, stating that CEVs do not have sufficient space for CLEC collocation. Remote terminals are generally smaller and more densely packed than CEVs.

In the unlikely event there is sufficient space for the CLEC to collocate at the ILEC remote terminal, the CLEC might be able to gain access to power and HVAC; and it is true that both feeder facilities and facilities connecting to the customers of the ILEC terminate on ILEC equipment at this location. However, capabilities to cross-connect facilities efficiently are not generally present within the remote terminal. This is because cross-connection of customer pairs is usually done at the Feeder Distribution Interface ("FDI"), not the remote terminal, and the feeder facilities to the central office are generally hardwired to the transmission equipment of the ILEC, such as DLC, rather than being wired to a frame-like device that permits flexible cross-connection to other service providers. Consequently, the availability of space at the remote terminal may provide the CLEC with a location in which to place its equipment, but will offer no apparent means of allowing the CLEC to connect its equipment to a customer's premises or to a facility that would connect to its own network.[44]

In fact, Qwest's SGAT indicates that when cross connections to the customer's facilities will need to occur at the FDI, the CLEC must provide its own cabinet or enclosure. Obtaining the rights of way and permits to construct a parallel cabinet, together with the costs of such

[44] Qwest may intend that the CLEC deploy its equipment in the remote terminal but connect to the subscriber's subloop by using spare pairs to the FDI. If so, it is not clear if and to what extent such spare pairs exist. But even then only a portion of the connectivity concern is addressed, because the CLEC would still need a means to cross-connect to high bandwidth facilities that run either to the central office where it has a collocation or directly to its own network. In the former instance, it is not evident that Qwest's remote terminals generally have the capability to cross-connect to Qwest high capacity feeder. In the latter case, assuming it is practical for the CLEC to deploy or otherwise obtain a high capacity facility to its own network, it is not evident that there is sufficient space or power for the required transmission equipment.

construction, only further illustrates the high economic barriers associated with remote deployment of DSLAM functionality by CLECs.

Qwest's reliance on the BFR process to make "other arrangements" available to meet its remote terminal collocation requirement is also misplaced. In addition to remote terminals and vaults, the only "other interconnection points" to which Qwest could possibly be referring are the FDIs (sometimes referred to as Serving Area Interfaces ("SAIs")). Collocation at alternate points such as the FDI do not hold out any better prospects than collocation at the remote terminal. In most instances, FDIs are too small to accommodate deployment of transmission equipment or DSLAM functionality. Moreover, FDIs generally lack the necessary power and HVAC for equipment deployment because they typically house only a set of cross-connection blocks. Thus, equipment deployment in FDIs would be impractical, and collocation would be limited to interconnecting CLEC-provided facilities to the ILEC distribution plant, assuming the CLEC could practically obtain the rights-of-way and the necessary capital to perform such self-provisioning of facilities.

For collocation at the FDI to be even remotely practical from a technical perspective, one would need to be confident that: (i) the CLEC could obtain the necessary permissions to construct a parallel FDI within the ILEC's right of way (and even if one CLEC could gain such permission, subsequent CLECs would likely encounter significant resistance); (ii) the CLEC could obtain from the ILEC use of its rights of way (or obtain its own), and economically deploy or obtain feeder plant to re-home a portion of the subscribers terminating on the ILECs' FDIs to the CLEC-deployed remote terminal; and (iii) the CLEC could obtain rights of way and

economically deploy or obtain high bandwidth feeder plant to connect its remote terminal/DLC either to collocation within the ILEC's central office or to its own network.[45]

All of the enumerated technical and logistical difficulties associated with remote deployment of DSLAM functionality at remote terminals or other interconnection points will make it very difficult, if not impossible, for CLECs to offer competing services in the instances in which Qwest has deployed DLC systems supporting DSLAM functionality. Even if a CLEC could overcome these technical hurdles, deployment would only make sense if the CLEC could accomplish it at a per-subscriber cost comparable to that which the ILEC could achieve, which is highly unlikely based on the deployment steps and inputs required.

The economic reality is that remote deployment of transmission equipment and DSLAM functionality by service providers seeking to access copper subloops is unlikely to occur in most areas. First, all of the steps enumerated above entail significant costs and lead times (e.g., rights of way acquisition, construction of facilities). Second, deployment is only economically viable if the appropriate economies of scale can be realized. In most cases, it will be extremely difficult for CLECs to realize the necessary economies of scale because each remote terminal or FDI at which it must collocate only serves a small number of customers, of which the CLEC will only capture a small percentage.[46]

Remote terminals, and to an even greater extent FDIs, serve a limited number of customers. In general terms, a central office is progressively broken down into smaller and

[45] The FCC recognized in its *UNE Remand Order* that the high costs and delays associated with collocation will impair a CLEC's ability to compete in the provision of data services. There is no reason to assume that the situation has improved. See *UNE Remand Order*, at ¶¶ 306, 309.

[46] To obtain the necessary economies of scale, the CLEC would need to be willing and able to undertake replication of a substantial portion of the ILEC's outside plant.

smaller geographical areas for the purposes of local outside plant design. A "Distribution Area" is generally the smallest component, comprised of about 100 to 400 living units with two distribution pairs typically assigned to each unit. A copper cable of appropriate size connects these living units to the FDI where cross connections are made to a larger branch feeder cable. The branch feeder cable is either a sub-cable within the main feeder cable that connects each distribution pair directly to the central office or it is the connecting facility to a remote terminal.

At the remote terminal, the copper distribution facilities from multiple FDIs are connected to a shared feeder facility that connects to the central office. Transmission equipment (generally referred to as Digital Loop Carrier or DLC) housed within the remote terminal multiplexes the traffic and, in some instances, performs electrical to optical (and vice versa) signal conversion, which permits an even greater degree of multiplexing and/or a higher transmission rate. In some instances the DLC, particularly newly deployed DLC, will provide enhanced transmission capabilities such as line splitting and DSLAM functionality. The DLC provides efficiencies because it allows one feeder facility to the central office to be shared among multiple subscribers while it also permits the facility between the customer premises and the central office to meet pre-established minimum electrical parameters.

The remote terminals may be pole mounted, placed on concrete slabs in the form of cabinets or huts, or placed in underground vaults. The actual size of the physical enclosure will depend on the amount and size of the equipment deployed by the ILEC. For example, a pole mounted remote terminal will generally house a small DLC with capacities of 24 or 96 lines. A cabinet or vault deployed DLC will typically be larger, with capacity to serve a few thousand customer lines when fully equipped. Deployment of DLC involves a relatively high fixed cost for site preparation and common equipment, with additional costs associated with plug-in circuit

packs for individual lines or groups of lines. Thus, for a DLC to be practical and economic, it must be nearly fully utilized by the carrier who has deployed it. The ILEC can realize these necessary economies of scale because it has designed its remote terminals to efficiently serve most of or the entire base of customers assigned to the remote terminal.

In contrast, an individual CLEC will never capture 100% of those customers for its advanced services. Accordingly, even taking into account the lost efficiency for the ILEC caused by competition from CLECs, the CLEC's ability to be cost-competitive is highly unlikely given the high fixed costs associated with deploying the necessary electronics and the small size of the addressable customer base serviced by a remote terminal.

Thus, to the extent that collocation at a remote terminal or other interconnection point is not possible: (i) because there is no space to house a CLEC's DSLAM functionality and readily connect it to the outside plant; or (ii) because such deployment is cost-prohibitive (both in terms of time and money), competition for customers who are served by remote terminals (or their equivalents) simply will not develop (except in specific market niches). The only way to ensure that competition develops is for service providers to have access to unbundled packet switching capabilities. Accordingly, Qwest must be required to fulfill its limited obligation to unbundle packet switching.

## D. Unbundled Dark Fiber

The FCC, in the *UNE Remand Order*, required ILECs, such as Qwest, to provide access to unbundled dark fiber because it is included in the definition of the dedicated interoffice transport network element.[47] Qwest describes the terms on which it proposes to provide access to dark fiber at Section 10.7 of the SGAT. As described in detail below, Qwest's proposal falls

[47] *UNE Remand Order* at ¶ 326.

short of providing nondiscriminatory access to dark fiber at any technically feasible point on just and reasonable terms.

Section 9.7.1 of Qwest's SGAT sets forth a definition of "Unbundled Dark Fiber" (UDF). This definition should be revised to make clear that UDF is available between a Qwest wire center and a CLEC wire center. Such dark fiber is commonly available, and failure to provide access to it would impair the CLECs' ability to provide service. If this change is made, conforming changes would need to be made to Section 9.7.2.12 (to provide that Collocation is not required on both ends of UDF), and 9.7.5.2.1 and 9.7.5.2.2.

Section 9.7.2.2 purports to impose on a CLEC a reciprocal requirement to make UDF available to Qwest. Qwest's imposition of this reciprocity requirement is without foundation in law. This section should be eliminated from the SGAT.

Section 9.7.2.3 sets forth Qwest's obligation to provide "existing Dark Fiber" facilities. This language impermissibly restricts Qwest's UDF offering to existing facilities and creates the presumption that UDF facilities that become available subsequent to the date of the SGAT will not be made available. This language should be modified to eliminate the reference to "existing" facilities.

Sections 9.7.2.4, 9.7.2.5 and 9.7.2.10 set forth certain limitations on Qwest's obligations to unbundle Dark Fiber based on internal requirements to reserve maintenance capacity and to reclaim capacity already in use. Any such restriction on dark fiber must be reasonable and relate to a likely and foreseeable threat to Qwest's ability to provide service as a carrier of last resort.[48] In Sections 9.7.2.4 and 9.7.2.10, Qwest proposes to adopts the requirements apparently imposed by the Texas Public Utilities Commission.[49] AT&T notes that these provisions have been

[48] *UNE Remand Order* at ¶ 352.
[49] Id. at fn. 694.

demonstrated by Southwestern Bell to be appropriate in Texas, but Qwest has not demonstrated them to be appropriate in Arizona.

AT&T's principal objection to these provisions can be addressed in Section 9.7.2.5(b). AT&T proposes that Qwest make more explicit when and how dark fiber is "designated for use in an approved, or pending job on behalf of Qwest or another CLEC." By making this provision more explicit and describing "approved, or pending jobs" more clearly, CLECs can be better assured that Qwest is not impermissibly restricting dark fiber capacity. With respect to Section 9.7.2.10, Qwest should make explicit the terms that the Commission has set for reclamation of Dark Fiber. If the Commission has not set forth any such terms, this provision should be eliminated.

Qwest's existing Section 9.7.2.11 requires a CLEC to combine dark fiber with other UNEs or CLEC's facilities. AT&T believes that in certain circumstances it may be appropriate for Qwest to combine Dark Fiber with another UNE or with CLEC facilities. AT&T proposes that his provision be changed to allow such combination.

Section 9.7.2.15 is objectionable insofar as it can be implied to require CLECs to obtain third party permission, license or authority to access rights of way. The parties' discussion regarding access to rights of way held earlier in this proceeding should guide the parties' resolution of this issue.

In Section 9.7.2.16, Qwest requires a CLEC to return UDF to "its original condition". AT&T disagrees that a CLEC should be required to pay to return UDF to "its original condition" without concern for reasonable "wear and tear".

In Section 9.7.3.2, Qwest should not only provide notification of the available fiber, but also the potential routes to be used. Qwest should make changes to the SGAT to accommodate such CLEC needs.

In addition to the specific changes mentioned above, Qwest should make certain additional changes to the Dark Fiber provisions of the SGAT. First, AT&T proposes that CLECs be given the option to provide good faith, non-binding forecasts of transport needs to Qwest and that Qwest have the opportunity to consider this information in good faith when determining its network design and expansion. Such an arrangement would allow Qwest to include forecast needs for all carriers and allow ample opportunity for Qwest to anticipates providing its services as required by law.

Second, Qwest sets forth unreasonably long time frames for access to UDF or specifies the lapse of a "reasonable" period of time. These provisions are found in Section 9.1.2.1, 9.7.2.10, 9.7.3.2, 9.7.3.3. Generally, Qwest should be required to specify time frames and provide quicker turnaround.

## III. CONCLUSION

For the above reasons, Qwest has not satisfied its burden of proof that it has complied with the Act and the FCC rules and regulations relating to subloop unbundling, line sharing, line splitting, packet switching and dark fiber. Therefore, this Commission must find that Qwest has not satisfied the checklist items associated with these topics.

Respectfully submitted on this 21st day of August 2000.

**AT&T COMMUNICATIONS OF THE MOUNTAIN STATES, INC.**
Mary B. Tribby
Richard S. Wolters
Michel Singer Nelson

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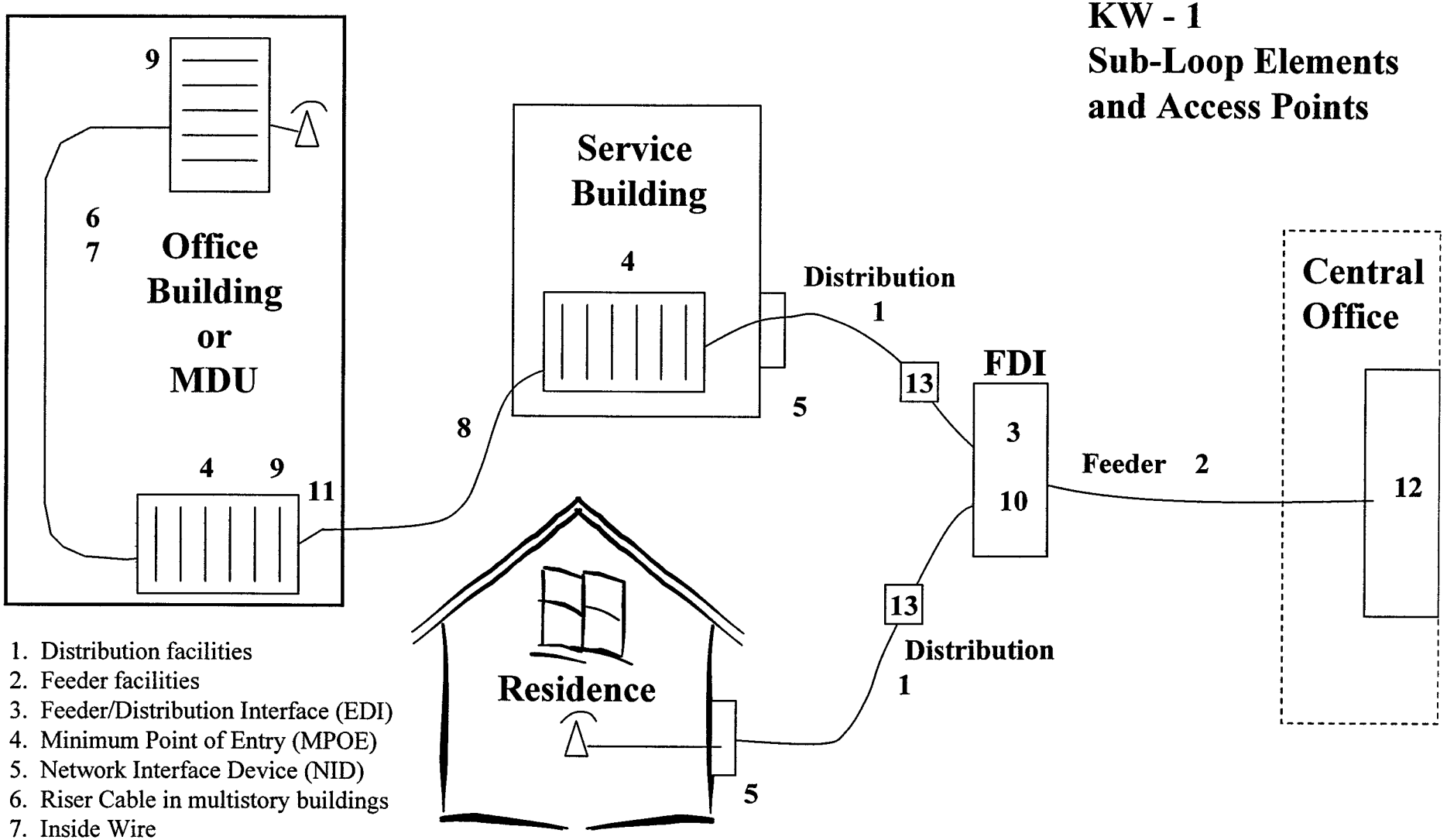
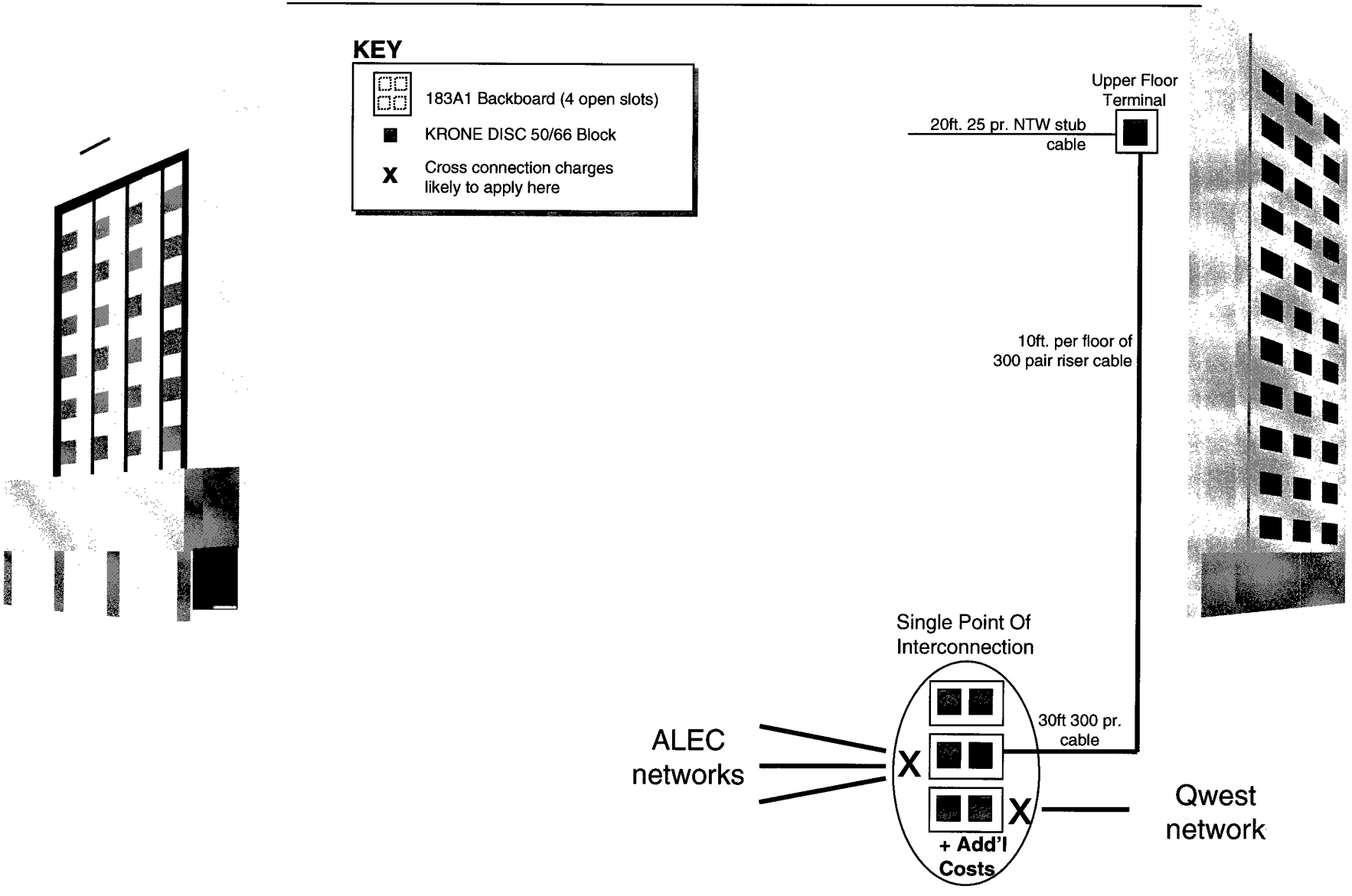
# KW - 1
# Sub-Loop Elements and Access Points




1. Distribution facilities
2. Feeder facilities
3. Feeder/Distribution Interface (EDI)
4. Minimum Point of Entry (MPOE)
5. Network Interface Device (NID)
6. Riser Cable in multistory buildings
7. Inside Wire
8. Peripheral Distribution Facilities
9. Wire Closets
10. DLC cabinets
11. Single Point of Interface (SPOI)
12. Central Office Terminal, COSMIC or MDF
13. Pole or Pedestal
14. And any other technically feasible element or point of interface


KEY
183A1 Backboard (4 open slots)
KRONE DISC 50/66 Block
X
Cross connection charges likely to apply here
Upper Floor Terminal
20ft. 25 pr. NTW stub cable
10ft. per floor of 300 pair riser cable
Single Point Of Interconnection
30ft 300 pr. cable
ALEC networks
X
X
+ Add'l Costs
Qwest network

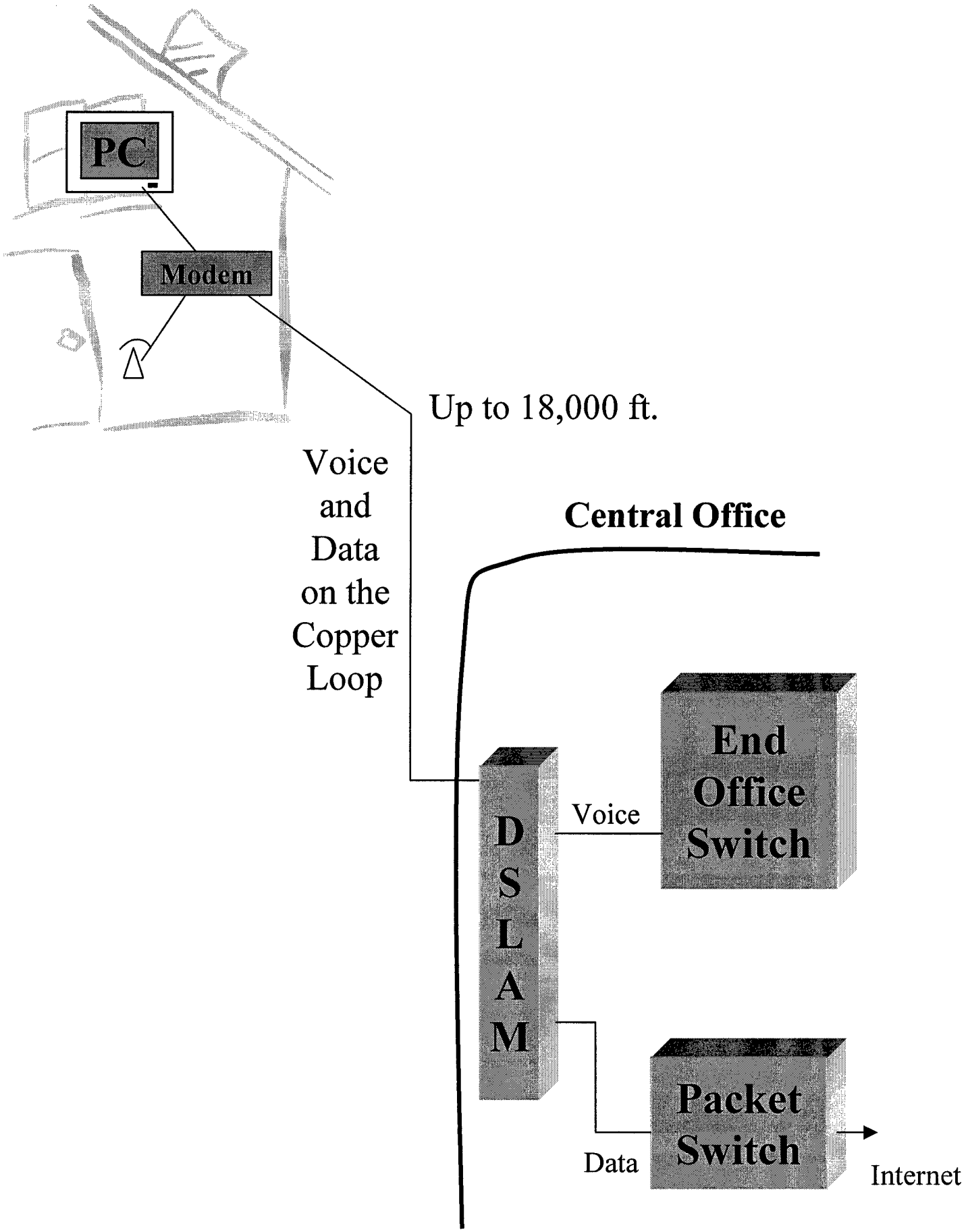
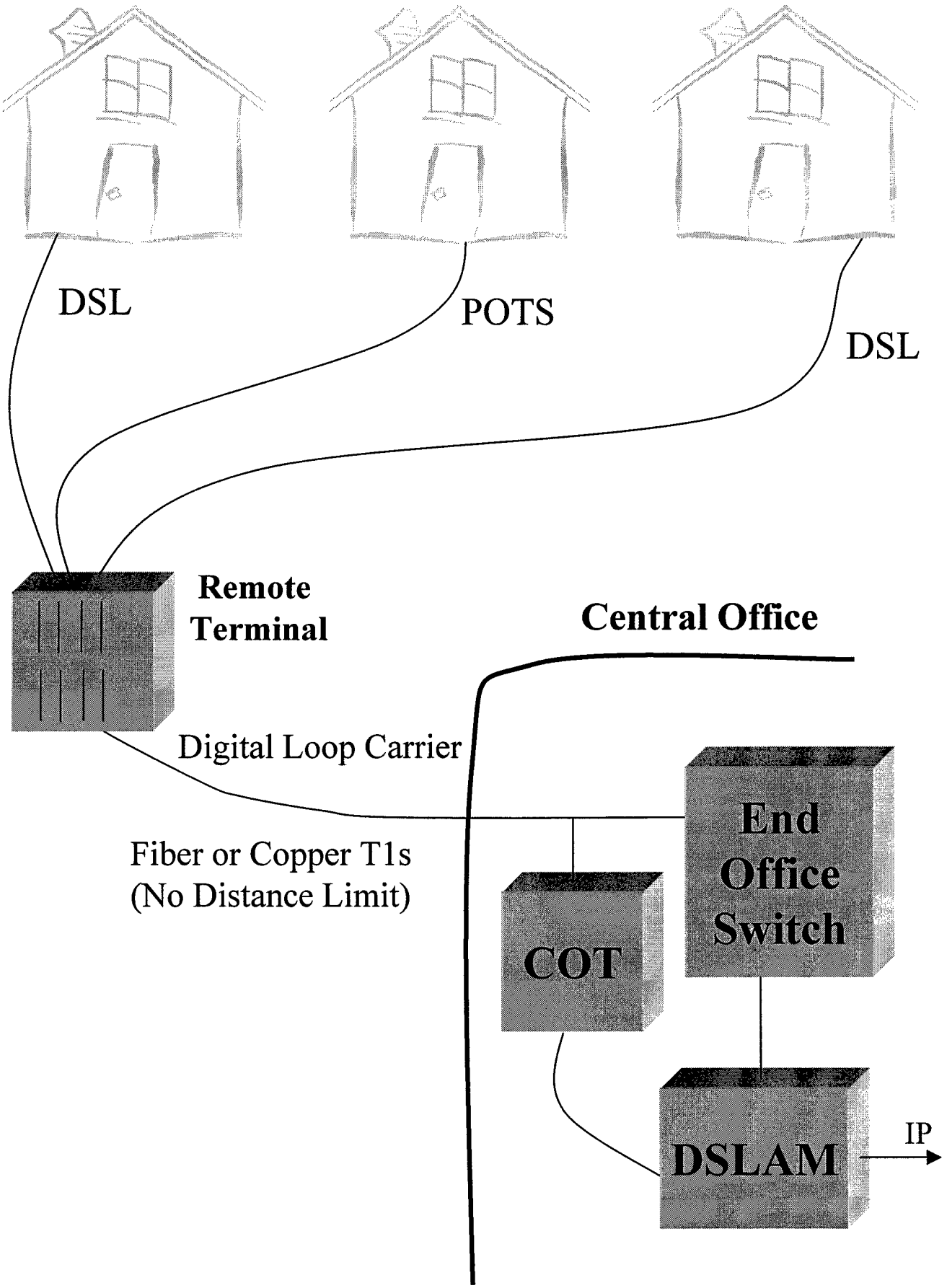



**Exhibit KW-3High Speed Internet Over Digital Subsciber Line**




**KW - 4 High Speed Internet Using Remote Terminals**

**BEFORE THE ARIZONA CORPORATION COMMISSION**

**CARL J. KUNASEK**
**Chairman**
**JAMES M. IRVIN**
**Commissioner**
**WILLIAM A. MUNDEL**
**Commissioner**

| | | |
|---|---|---|
| **IN THE MATTER OF U S WEST COMMUNICATIONS, INC.'S COMPLIANCE WITH § 271 OF THE TELECOMMUNICATIONS ACT OF 1996** | ) | **Docket No. T-00000A-97-0238** |

## VERIFICATION OF KENNETH L. WILSON

I, Kenneth L. Wilson, being duly sworn, hereby state that I am a Senior Consultant and Technical Witness with Boulder Telecommunications Consultants, LLC and have been retained by AT&T Communications of the Mountain States, Inc. and TCG Phoenix to provide expertise on technical matters in Arizona Docket No. T-00000A-97-0238. By this affidavit, I hereby verify the factual assertions as true and correct statements to the best of my knowledge and expertise in regard to AT&T and TCG Phoenix Comments filed for the First Amended Set of Workshops on Advanced Services, Line Sharing, Sub-Loop issues and Dark Fiber.

**FURTHER AFFIANT SAYETH NOT.**

Dated this __ day of August 2000.

_____

Kenneth L. Wilson

**STATE OF COLORADO** )

) **ss**

**CITY AND COUNTY OF DENVER** )

**SUBSCRIBED AND SWORN TO** before me this ___day of August, 2000 by Kenneth L. Wilson, who certifies that the foregoing is true and correct to best of he knowledge and belief.

Witness my hand and official seal.

_____

Notary Public

My commission expires:

_____

## CERTIFICATE OF SERVICE

I hereby certify that the original and 10 copies of AT&T and WorldCom's Comments on Incident Work Order Process regarding Docket No. T-00000A-97-0238, were sent via overnight delivery this 18th day of August, 2000, to:

Arizona Corporation Commission
Docket Control – Utilities Division
1200 West Washington Street
Phoenix, AZ 85007

and that a copy of the foregoing was sent via overnight delivery this 18th day of August, 2000 to the following:

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